

Dr. A. C. Post has given a somewhat similar case which occurred at the New York Hospital. The patient, aged 63, was affected with subelavian aneurism, and an explorative operation was performed "to determine the condition of the subelavian and innominate, with the intention, if the arteries should be healthy, to apply a ligature to the subelavian and carotid near their origin." The innominate, carotid and subelavian were exposed, but the former was so much enlarged that it was deemed inexpedient to apply a ligature to it or to its branches, so that the wound was closed, and the patient sent back to his bed. This was done October 26th, 1839, and he died exhausted by his sufferings, January 19th, 1840. (*New York Journal of Medicine*, No. 4.) The third case of this kind is that of Mr. Key, who commenced an operation upon a young woman affected with aneurism of the right subelavian, with the view either of passing a ligature around the innominate, or of tying both the subelavian and carotid near their common origin, as the state of the parts when disclosed by the knife might render most advisable. After exposing the arteria innominate, it was found impossible to surround that vessel in consequence of a tumour connected with it, and the operation, which had lasted one hour, was abandoned. The patient died on the twenty-third day after it.

Should the unfortunate results of all these cases prevent a resort to the operation of deligation of the brachio-cephalic trunk in future? We think but one answer can be returned to this query; and are happy to find that the author of the most celebrated of our modern treatises on Operative Surgery, Velpeau, has already formally proscribed it.

ART. II.—*On the Endemic Gastro-follicular Enteritis, or "Summer Complaint" of children, as it prevails in the United States.* By EDWARD HALLOWELL, M. D., Fellow of the College of Physicians of Philadelphia, Member of the Academy of Natural Sciences, &c.

CHOLERA INFANTUM, or "the summer complaint" of children, has been considered peculiar to the United States. Billard, in his work on the diseases of infants, alludes to its occasional existence in Paris. In the United States it prevails to a great extent, and the mortality from it is extreme. It occurs in all our large cities, carrying off several thousand children annually; it commences in the Southern States in May, and in the Middle and Western about the beginning or middle of June, and continues until near October, the greater number of cases being observed in July

and August. It is found chiefly in the lanes and alleys of our large cities among the poorer classes of society, but those in the higher ranks are by no means exempt from its attacks. It is stated by Dr. Condie, that during a period of fifteen years from 1825 to 1839 inclusive, 3352 infants perished of this disease in Philadelphia, being almost ten per cent. of the whole number of infants under five years who died during that period. In St. Louis, Missouri, during the years 1841, 1842, and 1843, 238 children died of it.* In 1823, 253 died of the same complaint in Baltimore. The average number of deaths annually in Philadelphia is about 200. The disease is confined almost exclusively to children between four and twenty months of age; cases, however occur as early as the age of two months, and at as late a period as three or five years.†

Causes of the disease.—Cholera infantum is considered to be dependent for its production upon a heated, confined, and impure atmosphere, acting “directly upon the skin, and indirectly upon the mucous surface, at a period when the latter is already strongly disposed to the disease from the effects of dentition, and from the increased development and activity of the muciparous follicles which takes place at that period.” The circumstances of its origin, however, are involved in doubt, and can only be determined by future and more correct observation. The exciting causes are stated by Dr. Dewees to be improprieties in diet and clothing. He observes also, that it is very often aggravated by worms, but such a complication has not come under our notice.

General description of the disease.—Cholera Infantum may be divided into three stages, based upon its anatomical characters. In their description we shall be guided chiefly by the results of our own observations.

Symptoms of the first stage.—This usually commences with diarrhœa, succeeded by vomiting, or with vomiting and purging; these symptoms are soon followed by fever of a remittent type with evening exacerbations; the pulse is small, quick, and frequent, occasionally full, and sometimes tense; the brain is often affected sympathetically; this condition is manifested by a tendency to delirium; the eyes have a fierce and wild expression, and the face is flushed; the stools in this stage vary much in consistence; at times they are thin and watery, but often pasty or mush-like; their colour differs also greatly in the course of the day, and from one day to another;

* *American Journal of Medical Sciences*, for January 1845, p. 245. Mortality among children in St. Louis, by Victor S. Fourgeaud.

† “I shall never forget the 10th, 12th, and 13th of July, 1841, when the temperature ranged every day between 80° at sunrise, 100° at 3 P. M., and 85 or 86° at 10 P. M.; wind southwest. Sky nearly clear, barometer lower than at any previous period during the month; on the 14th at 4 A. M., a thunder storm changed the scene. In three days dozens of children died every twenty-four hours; the disease was more frequent, more rapid, and more fatal than I have seen it since.”—*Letter from Dr. Engleman, St. Louis*, May 15th, 1845.

in a number of instances they presented the appearance of chopped egg, upon which boiling water had been poured; occasionally they consisted almost entirely of mucus. The period at which the vomiting is observed varies; it occurs usually on the second, but often as late as the fourth or fifth day; in some instances there is no vomiting throughout the course of the disease; in one case it did not make its appearance until a few days before death; the matter vomited consisted of the contents of the stomach, which were returned almost immediately after their entrance into it; these were more or less mixed with mucus; in infants at the breast the milk was returned in a curdled state, having an acid smell; in one instance it had the appearance of coffee grounds; the vomiting occurred for the most part three or four times a day, and sometimes oftener.

Temperature of surface.—The skin was occasionally moist, more frequently dry, warmer upon the head and abdomen; the latter is mostly warmer than the rest of the body, and often decidedly hot; the temperature of the extremities is natural, or more generally cool; occasionally it is warm; sometimes the lower extremities are cool while the upper retain their usual heat. The *respiration*, except in those cases complicated with other diseases, as whooping-cough or measles, was free, the number of respirations in the course of the minute amounting to 20, 24, 28, 29, 30, 33, 36, 40, 44, 48, 53, 55, 56, 60, 64, 66. When over 30 the respiration was more or less interrupted. The *tongue* in this stage was observed to be moist, but was often red at its tip and edges, and coated at its base with a yellowish or brownish yellow fur.

The *countenance* in the early stage, except when the attack was violent, was good, the eyes being bright and animated; occasionally the child would fall into a sleep from which it was easily roused. There was usually a considerable degree of irritability and restlessness, the little sufferer being pacified with difficulty. The sleep was often disturbed. The abdomen was occasionally tense and tumid, and somewhat painful on pressure; the thirst was often intense; it now and then happened, however, that drink was refused.

Anatomical characters.—These consist in an undue development of the follicles both of the stomach and intestines, or of one of those organs without inflammation of the mucous membrane. Children rarely die of cholera in the early stage; opportunities, therefore, seldom occur of observing the morbid appearances. M. Billard, who had ample opportunities, for the study of the diseases of children at the Hôpital des Enfants Trouvés of Paris, states that he had seen isolated follicles and follicular plexuses of the intestinal tube in considerable numbers and developed without being inflamed in twelve infants; three were aged from eight days to three weeks, two aged two months, the remaining seven were from nine months to one year; the symptoms of the cases he has published correspond so closely with those of cholera infantum, that, to use the language of Dr. Horner, it is evident had they occurred in this

country, they would have been named, and in fact are cases, of cholera infantum. M. Billard states, that most of these children had arrived at the period of dentition, so that there appeared to be a remarkable coincidence between the appearance of the teeth, and that of the organic development of the follicular apparatus of the intestines, the follicles performing an active part in the process of digestion by furnishing the surface of these organs with a fluid which in all probability assists in the elaboration of food. Dogs, he observes, and other carnivorous animals remarkable for their digestive powers, possess this apparatus in a high degree of development. In a lioness which died in this city some years ago, and of which I had the opportunity of making a post-mortem examination, the isolated follicles of the intestines were one-fifth of an inch in diameter.

The follicles are sometimes found to exist in great numbers from the first period of life, but in general they are not very numerously developed, except at the period above mentioned, or at a still more advanced age. (Billard.) Ræderer and Wagler, in their work *De Morbo Mucoso*, in which they describe the symptoms and anatomical characters of a gastro-follicular enteritis that prevailed in Göttingen in 1760 and 1761, give very beautiful and accurate drawings of the mucous follicles in a state of abnormal development.

The muciparous glands of the mucous membrane are, it is known, of two kinds, the isolated and the agminated. The isolated follicles are found both in the stomach and intestines, but are much more abundant and less uniformly developed in the former than in the latter; the agminated follicles or glands of Peyer occupy the free border of the intestine; these are rarely affected in cholera infantum. The isolated follicles are found less abundantly in the jejunum, than in the other portions of the small intestine. They are usually about the size of a pin's head, and have not inaptly been compared by Dr. Horner to grains of sand sprinkled over the surface of the intestine. They are elevated above the surrounding surface of the membrane, and have each in their centre a small grayish point. They consist simply of a duplication of the mucous membrane, and are readily effaced by passing the handle of the scalpel over them with some force; on cutting them open they are found to contain a small quantity of fluid. These glands receive each, according to Lieberkuhn, Meekel, and Beelard, an artery, a vein, and a nerve. They occupy both the summit and the interstices of the valvulæ conniventes, and are found disseminated over every part of the intestine both upon its free and attached surfaces. (See case of Charles Morand in Billard, *Maladies des Enfants*, and of Marie Boulefray in the work of the same author, entitled "*De la Membrane Muqueuse gastro-intestinale dans l'état sain, et dans l'état inflammatoire, ou recherches d'anatomie pathologique sur ses divers aspects, sains et morbids.*" Paris, 1825.)

Treatment.—We have thought it proper to intercalate with our own,

the opinions of older and more experienced members of the profession, more especially those of Dr. Chapman, Professor of Practice in the University of Pennsylvania. His acute perception of *symptoms*, appears to have impressed him more fully than most others with the importance of depletory measures in the treatment of this disease. *Preventive means.* In the beginning of June examine the condition of the gums of the child, and if swollen, lance them and send it into the country. A part of the country should be chosen which is elevated, where the air is pure and dry, and where there are no large streams nor stagnant water. Chestnut Hill, in the vicinity of Philadelphia, offers superior advantages in this respect. If it be impossible to remove the child to the country, especially if the apartments of its dwelling be not large and freely ventilated, let it be carried into the open squares of the city, or taken frequently across the Delaware in the afternoon. The sleeping apartments of children should be large and well aired. They should sleep upon a mattress or blanket folded upon the floor of the room or crib, and the covering should be light; they should be immersed in a cold bath at least once a day, or be freely sponged with cold water; the mortality among children in Philadelphia is said to have greatly diminished since the introduction of the Schuylkill water; the child should be confined to the mother's breast, care being taken not to overload the stomach; indeed, it often happens that the breast is given to the child when it requires only drink; the stomach then becomes distended and vomiting often ensues. Attention during the first year should be paid to the diet of the mother; she should avoid articles of a flatulent or indigestible character. Dr. Parrish recommends as a preventive means, when a predisposition to cholera is suspected, the occasional use of nutritious animal fluids; the sucking of small pieces of salt meat, as ham or dried beef, he observes, will sometimes be found productive of advantage. With the same view of giving tone to the stomach, he recommends that aromatics, as ginger tea, be used habitually during the summer, in those cases in which there is strong reason to apprehend the occurrence of cholera. This treatment may possibly be applicable under certain circumstances, as in the case recorded by him, but as a general rule we are not disposed to recommend it. Indeed, he himself observes, that it is applicable in all its details only to those in whom there is every reason to apprehend that the only alternative is between almost certain death and the most careful prophylactic treatment.

Treatment of the first stage.—We have seen that the first stage consists chiefly in an abnormal development of the mucous follicles of the stomach and intestines. This, as observed by M. Billard, is not, properly speaking, a true inflammation, being rather an intermediate stage between the normal state, and the state of inflammation. The follicles are simply in an excited condition, induced, as there is reason to suppose, by the powerful influence of heat combined with malaria, acting upon the nerv-

ous system. The object of treatment, therefore, is to subdue this excited condition, and to restore the healthy state of the skin, with which, and the mucous lining of the alimentary canal, there is a powerful sympathy. The functions of the liver, it is probable, are more or less impaired, but of this we have no direct evidence. If the child be not weaned, it should be confined to the mother's breast, care being taken to avoid overloading the stomach, thus adding to the irritation which already exists. If weaned, it should be confined to milk and water, rice, barley, gum, or toast water. The infusion of the benne leaf (*Sesamum orientale*), is also employed in this city, and is a useful remedy. The gums should be carefully examined and lanced if swollen. The most important point of treatment, however, is early removal to the pure air of the country. This should be done as soon as the disease has declared itself. Dr. George B. Wood, Professor of *Materia Medica* and Pharmacy in the University of Pennsylvania, states, that during the whole period of his practice, (nearly thirty years,) but one case occurred to him, so far as he can recollect, of a fatal termination of this disease, when the child had been sent into the country in the early stage of it. (*Practice of Medicine*, vol. i. p. 673.)

Blisters behind the ears have been highly recommended at this period of the disease, and we believe the practice is attended with decided advantage. Dr. Parrish was the first to suggest them. They should be applied immediately. The advantage arising from the early application of blisters behind the ears is confirmed by the late Dr. Eberle, a distinguished practitioner of this city, favourably known by his writings on the management of children. He observes, "during the last seven years, I have treated but few cases in which I have not at once applied blisters behind the ears, and I may confidently affirm, that since I have adopted this practice, I have been much more successful in the management of the disease than formerly. Their good effects arise, no doubt, from the counter-irritation they produce." The warm-bath should be administered every night and morning, and the child on coming out be gently rubbed with a piece of soft flannel; should there be much cutaneous sensibility, a portion of salt and mustard may be added to it. With a view of allaying the vomiting, various remedies have been employed. Injections of salt and water have been recommended by Dr. Dewees. Lime-water and milk, and the neutral mixture may be used for this purpose. Dr. Chapman states, that he has found the irritability of the stomach most effectually allayed by lemonade in doses of a teaspoonful, frequently repeated. It should be made pretty sour. Great advantage may also be derived from the frequent use of Seltzer or soda water. Dr. Parrish was in the habit of recommending it to be put up in 5ss phials, the contents of one of which to be given at a draught. The soda powders may also be employed. Chicken water was also directed with the same view. Stimulants, as strong coffee, sulphuric ether, turpentine, &c., are objectionable. Dr. Condie states, that when the irri-

ability of the stomach has been excessive, he has rarely failed in allaying it by the administration of the acetate of lead, in solution according to the following formula. R.—Aq. puræ $\bar{5}j$; acet. plumb. grs. v; acid acet. impur. $\mathfrak{m}v$; sacch. alb. pur. $\bar{3}iij$. Sig. A teaspoonful may be given every hour or two until the vomiting be suspended. We have been in the habit of directing the blue mass mixed up with gum arabic, with a view of overcoming the irritable condition of the stomach, and usually with success, or small doses of calomel, ($\frac{1}{12}$ of a grain every two or three hours, either alone or in combination with a very minute quantity of opium, $\frac{1}{16}$, $\frac{1}{20}$, $\frac{1}{30}$, $\frac{1}{40}$ th of a grain.) The blue mass may be given as follows: R.—Mass. ex hydrarg. grs. iv; g. acaciæ pulv.; sacch. alb., \bar{aa} $\bar{5}ss$; aq. $\bar{5}iss$. M. Sig. A teaspoonful every three hours.

If the vomiting be obstinate, a Cayenne poultice or small blister may be applied to the epigastrium. Should the disease continue, we next have recourse to small doses of calomel and ipecacuanha in doses from $\frac{1}{12}$ to $\frac{1}{6}$ of a grain of the former, and from $\frac{1}{4}$ to $\frac{1}{2}$ a grain of the latter, every two or three hours; advantage may sometimes be derived from substituting a small quantity of Dover's powders, (from $\frac{1}{4}$ to $\frac{1}{2}$ a grain,) for the ipecacuanha. We should be extremely cautious, however, in the use of opiates in this or indeed in any stage of cholera infantum. Benefit may also be derived from the application of a bread and milk, or mustard poultice over the whole abdomen, or, as advised by Dr. Eberle, a poultice composed of two or three tablespoonfuls of powdered black pepper, with a few teaspoonfuls of Cayenne mixed up with a common poultice. Embrocations to the abdomen and lower extremities, with spirits of camphor, may also be used with advantage. Should there be symptoms of acidity, which may be ascertained by testing the stools with litmus paper, a few grains of magnesia may be given, and should the discharges continue so as greatly to debilitate the patient, two or three grains of prepared chalk may be added to the prescription of calomel and ipecacuanha. We cannot, however, protest too strongly against the injudicious use of astringents in this or any other stage of the disease. We once witnessed a case in which cerebral symptoms of an alarming character supervened in consequence of a sudden arrest of the alvine discharges by means of the chalk mixture, and the child's life became a forfeit.

Second stage.—The vomiting which, in the commencement, was more or less frequent, now occurs but seldom, while the diarrhœa continues; the stools vary much in appearance, but are more or less bloody and painful; there is also much restlessness, and the child is observed to draw up its limbs at the time of the discharge; the predominating colour of the stools is dark-green, looking like chopped spinach; the colour, however, is occasionally lighter, but mixed with portions of a darker hue, or with lumps of yellow more or less curdled. They are often of a bright yellow or chrome colour, or of a dark brown or chocolate colour, caused

by the admixture of grumous blood. The appearance of the stools varies much in the course of the day, the change of colour probably depending upon the greater or less quantity of bile and acid in the intestines; the abdomen is more or less tumid and painful on pressure; tenderness of the abdomen, with drawing up of the limbs, and bloody discharges are the most important signs in this stage of the affection; the temperature of the abdomen is usually elevated, while that of the extremities is cool; the pulse is small and feeble, or it is frequent and tense; occasionally it is intermittent; as the disease advances, the emaciation already observed progresses, the skin about the neck and thighs hanging in folds; the eyes become sunken in the orbit, and each is surrounded by a dark areola; the nose is sharp, and the lips are shrivelled; the feet become œdematous, and the cutaneous sensibility is so much impaired that flies collect upon the face without causing any uneasiness; petechiæ are occasionally observed at this period; the tongue is dry and incrustated, and covered with aphthæ, and deglutition is now more or less painful; the child is often observed to thrust its fingers far back into the mouth, from dryness of the fauces; the appetite becomes greatly impaired, and there is almost constant thirst. Dr. Dewees mentions the eruption of a quantity of minute vesicles upon the chest, which he considers a fatal sign. Dr. Condie states that he has known many instances of recovery, even when the eruption has been most extensive and distinct. We have observed it but in a single instance; the eruption, however, was not confined to the chest, but occurred in other parts of the body. Dr. Chapman speaks of the appearance of pink-coloured stools as a fatal symptom; this does not correspond with our own observations.

Anatomical characters of the second stage.—These consist essentially in inflammation with softening of the mucous membrane and ulceration of the follicles, more especially of the large intestine. The mucous membrane of the stomach in many cases presents its usual appearance and consistence; in others it is more or less injected and softened, the softening extending occasionally to all the coats, resembling the condition described by Cruveilhier, as characteristic of the disease termed by him *maladie gastro-intestinale des enfans*, and by Jæger, Gairdner, and others, softening of the stomach.

Rilliet and Barthéz in their work on the diseases of children, notice the correspondence between the symptoms of softening of the stomach as described by Jæger, and those of cholera infantum; but an examination of the cases recorded in this paper will show that this condition of the organ is but rarely observed. The lining membrane of the stomach is not unfrequently covered with a layer of whitish opaque mucus easily scraped off with the handle of the scalpel; the mucous follicles both of the stomach and intestines are more or less apparent; the mucous membrane of the small intestine is occasionally softened, and for the most part pale in the

greater portion of its extent, contrary to the statements of Dewees and others, who consider the small intestine as being the exclusive seat of the disease. In one case the portion of intestine inflamed (the lower portion of the ileum,) presented a brick-dust colour interrupted with alternations of a pale yellow, mottled with red in some points; minute vessels were seen freely inosculating with each other; in other portions the inosculations were less distinct, there being a uniform reddish tinge. In another it was of a dull red, or brick-dust colour, minutely injected with red vessels, and in several points, especially upon the surface of the valvulæ conniventes, presented a dotted appearance; it occupied a portion of the intestine four inches in extent from the pylorus. In another case, (Case X.) the duodenum at its upper portion presented a slight shade of pink, with a few minute arborizations, and in several other instances there was a slight degree of inflammation affecting the duodenum at its upper extremity. There was also a slight inflammation of the glands of Peyer in one or two cases, but for the most part they presented nothing remarkable. The small intestines contained a considerable quantity of orange coloured mucus. The large intestine was more or less inflamed and softened in almost every instance; the inflammation existed in the form of bands, and presented a dotted arborescent appearance; in one case these bands were longitudinal; they were five or six inches in length, and several lines in breadth; in another case the bands were about two inches in length, having a minutely arboriform appearance, and were of a deeper red than the surrounding membrane; the first was situated one and a half inches from the cæcum, the second six inches from the first, and extended nearly the whole circumference of the gut; it was three inches in length and very minutely injected, but not so much as to destroy the arboriform arrangement. In most of the cases the redness was diffused, with occasional ramifications; in one instance the inflammation occupied the whole extent of the colon; it was of a vivid red throughout, and the membrane was much thickened. The inflammation was here also for the most part diffused, or in the form of bands occasionally presenting a ramiform appearance, the minute vessels freely inosculating with each other. From the margin of the follicles minute vessels were seen to radiate to the surrounding membrane, occupying the entire surface of the intestine, showing that the inflammation commenced in the follicles and extended subsequently to the mucous membrane. The follicles were often found to be more or less ulcerated, the ulcerations sometimes extending as far as the muscular coat; The ulcerations were more numerous and penetrated more deeply in the rectum than in other portions of the intestine; it was often completely riddled with them; we have not observed the surrounding membrane to be implicated to any extent; the mucous membrane was more or less softened in the greater number of cases; in one instance it was thickened; the membrane in this case was intensely inflamed. The coats of the intestine

were covered with a layer of mucus, sometimes so thick as to diminish considerably its calibre. It ordinarily contained a quantity of grayish coloured feces of the consistence of gruel. The lungs presented nothing remarkable but a slight engorgement posteriorly except in three cases, one of which was complicated with measles, and the remaining two with hooping-cough; in these cases the usual appearances of lobular pneumonia were present. In one case the patient had been attacked with pleurisy in consequence of exposure to the night air; at the autopsy a considerable quantity of pus was found effused in the cavity of the right pleura, and the lung was more or less disorganized. The peritoneum presented its usual healthy colour in all the cases observed; the liver was greatly enlarged in but a single instance, contrary to the statements of most authors who affirm this to be uniformly the case; the gall bladder was more or less distended with dark coloured bile staining the finger a deep yellow; the mesenteric glands were not enlarged; the spleen and kidneys presented nothing remarkable. In nearly all the cases the veins of the pia mater were more or less distended; the arachnoid was pale and moist, except in one case in which there was a slight opacity at the base of the brain; there was more or less effusion in the subarachnoid cellular tissue, for the most part limpid; occasionally it presented a whitish, opalescent or citron coloured appearance; the pia mater was more or less injected, but the injection for the most part appears to have been confined to the larger ramifications; it was easily removed by traction from the surface of the brain; the substance of the brain presented its natural appearance except in two cases, in one of which the central, and in the other both the central and the cortical portions were injected; it was softened in four of the cases; there was little or no effusion in the ventricles; in one instance the lateral ventricles appeared to be quite dry as if wiped with a cloth.

CASE I.—John William Macferran, ætat. nine months, light hair, blue eyes, was seized with a bowel complaint on Wednesday, Aug. 1st. The stools on that and the succeeding day were very frequent, occurring as often as once every ten or fifteen minutes; they were of a greenish colour, but no blood was observed in them; vomiting was not noticed until the 4th, when it occurred after taking some medicine, and ceased the next day. The pulse was frequent, the skin harsh and dry, and there was almost constant thirst; the abdomen was somewhat distended, but not painful on pressure; the lips and tongue were dry, the latter slightly coated at its base; the discharges on the 5th were much less frequent, occurring only about eight times, but the next day the diarrhœa returned, the bowels being disturbed about once every fifteen or twenty minutes. He was first directed to take powders of calomel, ipecac. and chalk, but producing sickness they were discontinued, when a mixture of blue mass was substituted; the discharges continuing with undiminished frequency they were laid aside, and powders each containing two grains of blue mass and chalk, and an equal quantity of bicarb. of soda were directed every three hours.

On the evening of the 6th he became worse; the bowels were not so

often disturbed, having been open only four times in the night, and three times the following morning, but a disposition to stupor first noticed in the evening now manifested itself with frequent jaetitations and great feebleness of pulse; these symptoms continued to increase during the day, when I was requested to see the patient in consultation. The following were the appearances observed: decubitus dorsal; face slightly flushed; lids of left eye about a line apart; of right a line and a half; eyes suffused; lids tumid; conjunctiva slightly injected; pupils somewhat dilated; right rather more than left; both contract on exposure to the light; frequent automatic motion of left arm, occasionally putting it to the head; head and abdomen warm; lower extremities cool; at times screams out suddenly; pulse 150, small and feeble, but regular; respiration high and somewhat laboured, 42; no cough; chest sounds well on percussion; abdomen not distended, *painful on pressure*; bowels disturbed four times in the night, and five or six times to-day; stools greenish, slightly streaked with blood, and painful; no sickness of stomach. R.—Ten leeches to abdomen; cold to head. An enema of starch after each stool; continue blue mass mixture.

8th. 9 A.M. Decubitus same as yesterday; stupor continues; lids equally separated, about two lines apart. Conjunctiva covered with a thin film; pupils unequally dilated; contracting on exposure to light, but more freely than yesterday; look fixed; no cries since early this morning; fingers of left hand incurvated and slightly rigid; no convulsive movements; face slightly flushed; lips livid; pulse thread-like, almost imperceptible; feet and hands cold; head and abdomen warm; respiration high, 55 per minute; deglutition easy; bowels open five or six times in the night, three times this morning; stools small and painful, of a dark green colour tinged with blood. Died at one o'clock.

Autopsy, Aug. 9th, twenty hours after death.—*Exterior.*—Emaciation moderate; eyes sunken; tips of fingers, nails, and palms of hands, of a purplish colour; fingers incurvated; slight rigidity; no œdema of either upper or lower extremities; posterior parts of body mottled from position.

Head.—But little blood exterior to dura mater; the longitudinal sinus contains a moderate quantity of fluid blood; veins of pia mater distended; some milky serum in the subarachnoid cellular tissue; no granulations or tubercles; pia mater injected; the injection extends to the smaller vessels, which are of a light red colour; cortical substance of good consistence; the pia mater is readily separated from it by traction; medullary substance injected, presenting a dotted appearance on incision; consistence normal; the ventricles contain about 3ij of citron coloured serum; thalamic and corpora striata firm; septum lucidum healthy. *Base.*—The pia mater presents the same injected appearance as upon its convex surface; slight opacity of arachnoid; normal; no granulations or yellowish matter beneath it. The cerebellum presents nothing remarkable.

Neck.—Larynx pale, not ulcerated; trachea normal; thymus of natural size and appearance.

Thorax.—Pleuræ pale and moist, containing no serosity. Lungs pale, fawn-colour anteriorly; upper lobes posteriorly of a light pink or rosy hue; inferior light purple or violet; middle lobe pale fawn colour throughout; tissue of upper lobes of a bright red colour, perfectly erepitant; lower lobe of right of same colour, left slightly engorged; no tubercles in any part of lungs; mucous membrane of bronchi pale, consistence normal; bronchial glands not enlarged. Heart of normal size; greatest thickness of left ven-

tricle three and a half to four lines, exclusive of columnæ carneæ; of right a line; a little red blood in the ventricles; beneath the tricuspid valve is a fibrinous coagulum which extends some distance into the pulmonary artery; another is seen occupying the left ostium venosum; they are both of recent formation, adhering but slightly to the inner surface of the ventricles; valves healthy; foramen ovale closed; pericardium pale, perfectly healthy, containing about 5ss of light citron coloured serum.

Abdomen.—Peritoneum lining abdominal muscles moist, and of a pearly white colour; intestines neither distended nor contracted; peritoneal surface pale. *Liver* somewhat enlarged, of a triangular form, the right extremity extending from the lower edge of the fifth rib as far as the crista of the ileum, the upper margin extending from the same point to within an inch of the ribs of left side, in contact with the diaphragm. Externally it is of a bright chocolate colour; the same colour prevails internally, but is perhaps a shade paler; tissue quite free, not engorged; the two substances distinct: gall bladder much distended with dark coloured bile, of the consistence of West India molasses; mucous membrane of œsophagus at its lower part of a deep red colour, with no trace of vessels; surface dry; no ulcers; crypts not developed; stomach moderately distended, containing about 5ss of dark coloured fluid, of the consistence of gruel; mucous membrane covered with a thick coating of whitish opaque mucus, easily scraped off with the scalpel; surface beneath of a pale fawn colour in its pyloric half, remaining portion of same colour, except in the great cul-de-sac, where there are numerous arborizations, giving to this portion of the membrane a light pink or rose coloured hue; consistence normal, except along greater curvature, where it is somewhat softened; strips of ten lines being obtained from lesser curvature, four from greater, and five from great extremity. Numerous isolated follicles are observed upon its surface, more numerous and distinct towards pyloric orifice and along lesser curvature. *Small intestine.*—The upper portion of duodenum contains a quantity of dirty yellowish looking matter, having a brighter tinge towards its middle; at its lower part, it is of a dirty green colour, and of the consistence of thick mucus; the upper part of the jejunum also contains this matter, but the rest of the intestine, as well as a considerable portion of the ileum, is perfectly empty; the mucous membrane of the small intestine is pale throughout, and of normal consistence; strips of from three to five lines being obtained in the duodenum, and from five to six in the jejunum and ileum. Isolated mucous follicles are seen here and there upon its surface, but they are few in number; the glands of Peyer are not unusually developed. *Large intestine.*—Mucous coat throughout covered with a thick layer of tenacious mucus, having almost the consistence of jelly, opaque, and of a whitish colour, containing minute shreds or flocculi of coagulable lymph; the quantity of this substance is so great as to augment considerably the weight of the intestine, and, at first view, gave the impression that the coats of the intestine were enormously thickened; it is, however, readily scraped off with the scalpel; the membrane beneath is more or less inflamed throughout, of a dirty yellow colour, mottled or marbled with pink, here and there presenting a dotted appearance without trace of vessels, numerous crypts highly developed, more or less ulcerated, and occupying its entire extent; the lining membrane of the appendicula is thickly studded with them, giving it a highly reticulated appearance; the largest are about a line and a half in diameter, with a dilated central orifice of nearly the same dimensions; the ulcerations are for the most part confined

to the cellular coat, but several of them in the rectum extend as far as the muscular; the follicles are of a whitish opaque chalk-like colour, differing in this respect from the more uninflamed portions of the surrounding mucous membrane, which have a pearly hue after long maceration; it would appear that the whole of the gland in the commencement of the disease, contained this whitish caseous looking matter, and that the greater portion of it was subsequently removed, leaving only the margin or border surrounding the ulcerated opening in the centre; the follicles are more numerous, larger, and more deeply ulcerated in the rectum, than in other parts of the large intestine; the entire thickness of the coats of the intestine is about $\frac{3}{4}$ of a line; the mucous membrane is much softened throughout, strips of not more than a line or two being obtained; mesenteric glands about the size of peas, pale, firm, not tuberculous. Spleen of a light purple or violet colour externally, about two inches in length, $1\frac{1}{2}$ in breadth; tissue quite firm. Kidneys and pancreas healthy. Bladder contracted, containing not a particle of urine; mucous membrane pale.

Treatment.—We have seen that the second stage is characterized chiefly by tenderness of the abdomen on pressure, drawing up of the limbs, and bloody stools, symptoms which depend upon inflammation of the mucous membrane, more especially of the large intestine. The treatment, therefore, in this stage should be antiphlogistic. There can be no doubt, we think, that the mortality from cholera infantum has arisen in a great degree from not keeping its inflammatory character sufficiently in view. We have found inflammation of the mucous membrane of the large intestine in every autopsy that we have made, and evidence of its existence in an advanced stage of the disease clearly demonstrated in all the published cases that have come under our observation.

The chief object of the present essay, indeed, is to direct the attention of the profession to the above fact, and to the importance of antiphlogistic treatment, instead of the purgative plan usually pursued and with such fatal results. When the abdomen is distended and painful on pressure, with a tense, frequent or full pulse, v. s. should be resorted to. This is occasionally required at the commencement of the first stage, when there is much cerebral determination; should v. s. not be sufficient to remove the inflammatory condition, or when the state of the pulse does not indicate it, leeches or cups are to be applied to the abdomen; we have not been in the habit of directing cups in this affection, but from the great benefit which we have seen result from their use in the lobular pneumonia of children, we have no hesitation in recommending their employment. Mothers naturally object to what they conceive to be a harsh remedy, but by persuasion they can generally be induced to submit to it, and the great advantage we have uniformly derived from their employment in the last mentioned disease, we think warrants their use in this. The amount of pain is much less than is supposed, and the quantity of blood is more suddenly and effectually abstracted than by leeches, besides which there is no risk of subsequent hemorrhage. One, two, three, or

four cups may be applied to the abdomen, and be repeated should pain on pressure or the bloody discharges continue. It should be remembered that the reaction in children is seldom great, and that the most intense inflammation of the mucous membrane may exist, while the temperature of the skin is but little elevated; or may be quite cool, and the pulse feeble. Stimulants in these cases are too often given, and may destroy the patient; the true course is to pursue a cautious antiphlogistic treatment, supporting the patient at the same time by the blandest articles of nourishment. It has been advised to apply leeches to the anus, and this may occasionally be done with advantage. Injections of cold water, or iced water as the severity of the case may require, are recommended by Dr. Millar of New York, and we believe with great propriety. The remedy, he observes, though generally advisable, appears to be best adapted to that period of the disease when the alimentary canal has been previously well emptied of its acrid and offensive contents. Should there be reason to suppose the existence of such accumulations, the discharges being watery and mixed with indigestible food, with a tumid state of the abdomen, a grain of calomel may be given every hour or two until the bowels are disturbed. We have observed that the small intestines are but little affected in this disease, and we should think, therefore, that no objection could be made to the use of mild laxatives for this purpose, the treatment being the same as in dysentery. Castor oil, the oleaginous mixture in small doses, or the oil of butter, may also be employed. Injections of the liquor plumbi subacetat. dilut. (5j to a gill of water) are also productive of benefit, or the acetate of lead, in the proportion of five grains to a gill of water, for a child of two years. The internal remedies should be small doses of calomel and ipécacuanha as prescribed in the first stage, or the same dose of calomel combined with $\frac{1}{4}$ to $\frac{1}{2}$ a grain of Dover's powders every three hours. It may often be advantageously associated with acetate of lead, to the amount of from $\frac{1}{6}$ to $\frac{1}{4}$ of a grain, but we believe this remedy better adapted to a more advanced period of the disease. When there is much irritability, and the skin not preternaturally dry, the ext. hyoscyam. may be substituted for the Dover's powders. Emetics we consider decidedly objectionable in every stage of cholera infantum, notwithstanding that they have been recommended by high authority.

It will be observed that inflammation with ramollissement of the mucous membrane of the stomach, exists in a large proportion of cases, and emetics under such circumstances must be decidedly injurious. With regard to purgatives the same objection applies. *Laxatives* may occasionally be proper when there is reason to suspect the accumulation of irritating matters in the intestine, and of them the best, as above mentioned, is calomel either alone or in combination with a small quantity of Dover's powders (one-quarter to one-half of a grain), and followed by a dose of castor oil. We cannot too strongly urge upon the young practitioner the necessity of cau-

tion in the use of opium in this disease, or indeed in any other in which there is a determination to the head. The warm bath is a useful remedy, unless the child be too debilitated; he should be immersed in it up to the neck, and cloths wrung out of cold water applied at the same time to the head, in order to lessen the determination to the brain. Should the application of cups or leeches to the abdomen not be sufficient to remove the inflammatory symptoms, and the pulse be feeble or the patient much exhausted, blisters may be resorted to, but great care should be exercised in their employment lest gangrene ensue. We have seen very troublesome consequences arise from the application of blisters to children, and in one instance we think the child lost its life from their imprudent use. They should never be suffered to remain more than three hours, and after their removal, a large emollient poultice should be applied over the whole abdomen. Should there be symptoms of cerebral congestion manifested by stupor, rolling about of the head, or a disposition to coma, cloths wrung out of cold water, or vinegar and water, or a mixture of equal parts of lead water and spirits of wine should be applied to the head. Should these symptoms continue, leeches in small numbers may be applied to the temples or behind the mastoid processes. Counter irritation should also be made by stimulating pediluvia, or the application of sinapisms to the extremities.

Cholera infantum not unfrequently becomes chronic, the symptoms being very much the same as those of ordinary diarrhœa, or the patient may sink into a typhoid state. The remedies in this case consist of the warm bath, to which salt, mustard, brandy or Cayenne pepper may be added, counter irritating applications to the abdomen, and the internal use of mild astringents. When the diarrhœa is such as to exhaust the patient, the cretaceous preparations may be cautiously employed, great care being taken not to arrest the discharges too suddenly.

The following prescription has been proposed by Dr. Parrish for this purpose. R.—Potassæ sub-carb, ʒj; gum acaciæ, ʒj; tr. opii, gutt. vj; aq. cinnam, ʒiiss; sacch. alb., ʒj. M. A teaspoonful to be taken every two or three hours. Should this not be sufficient, the following may be employed. R.—Test. ostrear. ppt., ʒiiss; gum acaciæ, ʒj; tr. thebæicæ, gutt. x; sacch. alb., ʒj; aq. pur. vel aq. cinnam., ʒiv. M. Sig. A teaspoonful every two hours.

Dr. Condie states that he has derived great advantage from the use of charcoal in chronic cases of this affection, when the discharges were of a dark colour, acrid and offensive. He employs it in combination with powdered rhubarb, ipecacuanha, and the extract of hyoseyamus, according to the following preparation. R.—Carb. ligni, ʒj a ʒij; pulv. rhei, ʒij; ipecac. grs. iv a grs. xij; ext. hyoseyam. nig. grs. xij. M. ft. chart. xii. Sig. One to be taken every three or four hours. Lime water and milk may also be given in these cases, also equal parts of charcoal and magnesia.

Care ought to be taken not to continue the use of the charcoal too long, as serious accidents are said to have arisen from its accumulation in the bowels. The infusion of soda and hickory ashes is said also to be beneficial. The syrup of rhubarb may be given in doses of from twenty drops to a teaspoonful every two or three hours, or the powder according to the following formula. R.—Pulv. rhei, grs. xv; pulv. ipecac. grs. v; magnes. calcinat. grs. xx; sacch. alb. \mathfrak{z} j; tr. opii gutt. x; ol. anis. gutt. v or gutt. vi; aq. \mathfrak{z} ij. M. A teaspoonful every hour or two (Dr. Chapman). Columbo root in powder or infusion may also be employed. (Dose from two to three grains.) The infusion of the common logwood (*hematoxylon campechianum*), Dr. Chapman states, was much employed by Dr. Physick in this stage of the disease. The dose is a teaspoonful. A decoction of the bark of the pomegranate root (*punica granatum*), or of the flowers, is also considered useful. The best of all these vegetable astringents, according to Dr. Chapman, is a strong infusion of the leaves of the dew (*rubus trivialis*) or of the blackberry root (*rubus villosus*). The dewberry is preferable from its greater strength. The dose is about a teaspoonful. The alum plant (*Heuchera Americana*), a common plant in the neighbourhood of Philadelphia, has also been highly recommended as an astringent in this affection. Alum, in the dose of one or of two grains with a small quantity of opium may also be employed, or the acetate of lead in combination with the same remedy. Dr. Eberle states that in the advanced stage of this disease, he has occasionally derived considerable benefit from the use of the tartrate of iron according to the following formula. R.—Ferri tartrat. grs. xl; syr. zingiberis, \mathfrak{z} ss; aq. pur. \mathfrak{z} ij. M. From twenty to forty drops to be given to an infant four or five times daily. Dr. Chapman advises the sulphate of iron under the same circumstances. R.—Ferri sulphat. grs. ij; acid sulph. gutt. x; sacch. alb. \mathfrak{z} j; aq. \mathfrak{z} j. M. Dose a teaspoonful as often as necessary. Dr. Meigs has written favorably of a plunging tepid bath made of the infusion of the white oak bark. *American Medical Recorder*, vol. iii. p. 507. He states that it produced a rapid amendment in one case in which he tried it, and a perceptible improvement in another. When the discharges from the bowels are small in quantity, thin, dark coloured, and highly offensive, with flatulency, the spirits of turpentine may be given. Turpentine in the acute form should never be employed. It is a "deadly remedy." The following is the formula proposed by Dr. Condie. R.—Mucilag. g. acaciæ, \mathfrak{z} ij; sacch. alb. \mathfrak{z} vj; spt. æth. nitros. \mathfrak{z} ij; spt. terebinth. \mathfrak{z} j; magnes. calcinat. grs. xij; spt. lavand. comp. \mathfrak{z} j. M. Sig. A teaspoonful three times a day, or oftener when the child is over two years of age. The juniper oil is also considered an excellent palliative for this purpose. R.—Ol. junip. \mathfrak{z} j; sulph. ether \mathfrak{z} ss; tr. opii. gutt. xl. M. Sig. From ten to fifteen drops from three to four times daily. The balsam copaiba may also be employed. The dose is from three to five drops. Dr. Parrish states that he has frequently directed an infusion of bark and cinnamon in lime water in the

following proportions. R.—Best bark coarsely powdered, \mathfrak{zss} ; cinnamon \mathfrak{zij} ; lime water \mathfrak{zijj} . M. It should be suffered to stand a little while and then decanted; a dessertspoonful may be taken several times a day. With this remedy we have no experience. The bark jacket is also occasionally employed. Injections of bark may likewise be given. These remedies should be employed only when the symptoms are of a typhoid character, the vital forces being insufficient to sustain the patient. When the child is greatly exhausted, stimulating frictions to the body with flannels wrung out of hot brandy and water, or whisky should be used, or if the exhaustion be extreme, it may become necessary to resort to stimulants internally, as wine whey, or a weak solution of carbonate of ammonia. Dr. Eberle states that in these circumstances he has derived great advantage from the tincture of cinnamon in doses of from fifteen to twenty drops in some mucilaginous fluid every four hours. When the discharges are very frequent, attended with great exhaustion, the spiritus ammoniæ aromaticus in combination with the chalk mixture is a useful remedy. Dr. Hartshorne, one of the most eminent practitioners of this city, recommends the use of creosote in the advanced stage of this disease. The following is a formula he employs. R.—Creosote gr. j; test. ostrear. præparat. \mathfrak{zij} ; g. acaciæ pulv., \mathfrak{zss} ; aq., \mathfrak{zvj} . Dose a teaspoonful every two hours for a child two years of age.

Tannin, we would suppose might also be advantageously employed in the chronic form of the disease when the discharges are abundant. It is said to be less likely to irritate the stomach and bowels than the ordinary astringents. The dose for a child of two years is one-fourth of a grain every three hours, or of the pure tannin one-twenty-fourth of a grain repeated as often.

When there is an aphthous condition of the fauces, Dr. Parrish thinks he has found nothing do so much good as a gargle of lime water and bark. Dr. Griffiths, he observes, in some protracted cases of cholera, was in the habit of prescribing scalded lemonade to the child, and with a very happy effect.

Great attention must be paid to the diet. If not weaned, the child should be confined to the breast, with the occasional use of barley water, toast, or gum water. So long as the inflammation is inactive, or when it has subsided or has assumed a chronic form, articles of a more nourishing kind may be allowed, as boiled milk, tapioca, arrowroot, or sago, or thin oatmeal gruel, or flour boiled in milk; the flour should be put in a rag, and then boiled until it becomes hard, and grated. This, we believe to be a most excellent article of diet. We know a remarkable instance of chronic dysentery in the adult, cured by small doses of calomel and opium, and confinement to this diet when all other means had failed. In the chronic form of the disease when the patient is greatly debilitated, the appetite occasionally becomes craving for certain stimulating articles of

food, which it may be right to gratify. Dr. Parrish relates several instances of this kind in his lectures. Dr. Wistar, he observes, used to mention the case of a child that was brought to the parlor while the family were at dinner. It was extremely weak, and seemed to be in the last stage of the disease. It showed a strong disposition for some ham which was on the table. The black skin covering the ham was the part which it seemed particularly to desire. It was gratified, and it did not discontinue sucking the piece until it had deprived it of its nutritious juices. From this time it began to recover, and ultimately got well. Dr. Wistar was so convinced of the importance of the above practice that he used to tempt his little patients with small pieces of ham. Some would eat it, others seemed to have no desire for this kind of food. In the latter case he did not press it upon them. Dr. Parrish states that he often prescribed the essence of ham in these protracted cases of cholera. He directs the juice to be bottled up to prevent it from becoming rancid, and to be used as occasion requires. He also relates an instance of a child under similar circumstances that seemed very anxious to eat some butter which was on the table; this child was also indulged, and it continued to devour the butter, lump after lump, until it had made way with the whole. From this time it was allowed as much butter as it desired, and under this plan it recovered.

The same directions with regard to ventilation apply to this as to the first stage.

Third stage.—Symptoms. The symptoms indicative of this stage of the affection are an unusual disposition to drowsiness or stupor, rolling of the head, and chewing motion of the under jaw, succeeded by convulsive movements or rigidity, of one or more extremities followed by paralysis. When the disease has progressed thus far, it may be considered almost, if not entirely beyond hope.

Anatomical characters.—These consist essentially, in disorganization of the structure of the brain from softening of its tissue. The softening is sometimes general, but is more often confined either to the cortical substance, or to the central portions of the brain and cerebellum. The softening may exist to such a degree as to cause the brain readily to give way on slight pressure, or its substance may be rendered quite diffuent so as to resemble cream. These effects are the result of long continued irritation; the substance of the brain when cut into, usually presents numerous red spots from effusion of blood. The pia mater is more or less injected, and its veins much distended. There is also effusion of serum in the subarachnoid tissue, and to a greater or less amount in the lateral ventricles. This, however, is not always the case, the surface being sometimes quite dry.

CASE II.—Patrick Clark, ætat. 1 year and 8 months, hair brown, eyes gray, with the exception of an attack of croup at the age of three months,

enjoyed good health until the 28th of June, when he was seized with diarrhoea, succeeded the next day by vomiting; the vomiting commenced in the afternoon, and continued at intervals during the whole of the next day and part of the day following; the stools in the commencement amounted to about fourteen in the twenty-four hours, and were of a yellow colour, resembling the yolk of an egg; no blood was observed in them until yesterday, when there was also a slight return of the vomiting. He has not yet been weaned. Present state, July 5th, 1838. Decubitus dorsal in the lap of the mother; lids not entirely closed, eyes sunken in the orbits, and surrounded with a leaden-coloured areola; appears quite languid and weak, uttering frequent moans. This morning the eruption of measles made its appearance, extending over the face, breast and upper extremities, the back of the neck, and between the shoulders, where it is most copious; skin warmer than natural, hot at night; head and abdomen warmer than other parts of body; pulse 130, respiration 30, tongue coated with a whitish fur, papillæ prominent; bowels open seven times within last twenty-four hours; stools for the most part of a greenish-yellow colour, and quite offensive, at times consisting entirely of blood, not painful; no convulsive movements; has been taking the following powders by the advice of Dr. Boyer. R.—Sub. mur. hydrag. grs. ij; cret. ppt. ℥j. M. ft. pulv. xij. Sig. One every three hours.

6th. Worse; bowels open twelve times since last report; discharges painful; stools yellow, not curdled, rather large, not bloody, has vomited once. *Present state*.—Great irritability, crying almost incessantly, with frequent automatic movements of hands; these paroxysms are often interrupted by a doze, which lasts but for a few minutes; eyes slightly diffused, lids red and tumid, equally separated, about two lines apart; nostrils not in motion; lips and tongue quite dry, the latter covered at base and in its middle with a whitish yellow fur; skin of extremities cool, warm upon head and abdomen, which is supple and bears pressure well; pulse 130; eruption of measles confined to upper half of body, generally pale, but quite distinct, looking like flea bites; respiration 36, cough dry, of moderate frequency; chest sounds well on percussion; pupils not dilated; no convulsive movements. The most marked symptoms are the extreme restlessness, and the peculiar ery accompanying it indicative of cerebral irritation. R.—Mustard pediluvium; stimulating poultice to abdomen; ten leeches to temples; continue powders at night.

7th. Bowels open twenty times or more since last visit; stools slimy, looking like "corrupted blood;" abdomen not distended, somewhat tense; cries when pressure is made upon it, but whether from pain is a matter of doubt; tongue coated with a whitish-yellow fur, thicker at edges than in middle; slight nausea but no vomiting; decubitus dorsal, somewhat inclined to right side, the child dozing for a few minutes, then awaking and crying, with constant jactitation; eruption pale upon abdomen, very pale and sparse upon lower extremities, more vivid and confluent upon arms; respiration 29; cough more loose, not frequent; pulse 125, of moderate volume, regular; pupils slightly dilated, contracting rather feebly on exposure to the light; urine free. R.—Mass ex hydrag. grs. iij; mucilag. g. acaciæ ʒiss. Sig. A teaspoonful every three hours. R.—Emplast. vesicat. 2+2 to calves of legs.

8th. Bowels so often disturbed, that no account could be kept of the number of discharges; three times during visit, which lasted about three-quarters of an hour; stools of a greenish-yellow colour in the night; those of

this morning of a light yellow or fawn colour, looking like pus, with grumous blood intermixed, and of gelatinous consistence; abdomen tense, not tumid; painful on pressure; the pain appears greatest in right iliac region; nostrils slightly in motion, lips dry, mouth partially open; respiration 33, high and laboured; cough frequent, short, and rather loose; chest sounds well on percussion throughout; sonorous rale on both sides posteriorly, more distinct in front where the respiration is pure, and expansive, pulse 132, without tension, regular, not intermittent, temperature of skin not elevated, but warmer than natural, nearly uniform; moans and cries frequent; left arm much in motion, right but seldom; no convulsive movements. R.—Twelve leeches to temples; cold affusions to head; injections of starch every hour; mush poultice with Cayenne pepper to abdomen.

9th. Bowels open thirteen times since last visit; stools for the most part of a light yellow, or dirty yellowish-white colour, mixed with grumous blood, and voided with pain; several of them were quite yellow, not containing any blood; others were of a deep grass green colour; tongue clammy, covered with a whitish exudation, occupying its sides chiefly, also the anterior half of the palate, the gums and inside of lips; respiration 48, cough rare, rather loose; pulse 140, small and regular, thirst constant; skin dry and harsh, but little warmer than natural; cries more feeble; deglutition easy.

10th. Stupor almost constant, interrupted by frequent moans and cries; left arm much in motion, pupils dilated; vomited once, in the night, after coughing; bowels open eight times since last visit; stools of a dark-green colour, and slimy, attended with much pain; during an evacuation, the limbs are drawn upwards, and the pain is so great, as to cause the child to scream out; respiration 48, high, and laboured; cough frequent, but loose; percussion normal, with mucous and sonorous rales posteriorly; pulse 140, quite feeble. R.—Blistered surfaces to be dressed with equal parts of ung. hydrag., and simple cerate; the same to be rubbed in arm-pits and groins.

11th. Died last evening at 7 o'clock. The bowels were disturbed twice after the last visit, the stools being of a dark green colour. The child appeared to be in great pain, but no convulsive movements were observed.

Autopsy, July 11th, sixteen hours after death.

Exterior.—Emaciation moderate; no œdema of feet and ankles; posterior parts of body, mottled from position.

Head.—But little effusion of blood on separation of dura mater; arachnoid moist, but no effusion beneath it; veins of pia mater much distended, the membrane itself not injected; cortical substance of a pale ash colour; medullary substance quite pale; no dotted points observed on cutting into it; it appears to be softened throughout; the corpora striata, and thalami nervorum opticorum are firmer than surrounding portions of brain, but moderate pressure made upon any part, causes it to give way readily; no serosity in cavity of ventricles; the surface is quite dry; the cerebellum also appears softer than natural, but in other respects presents nothing remarkable.

Thorax.—Pleuræ free, containing no serosity. Anterior surface of lungs of a pale fawn colour, except toward base, where they are of a light pink, or violet hue; posteriorly they are of a violet colour, more deep towards base; lower lobe of left lung engorged; on cutting into it, exudation of spinous blood of a dark colour; tissue crepitant; lower lobe of right lung also engorged but in a less degree than that of left; upper lobes healthy;

mucous membrane of trachea and bronchi pale, not injected. Heart of normal size, firm; left ventricle about three lines in thickness; pericardium healthy, containing no serosity; œsophagus pale; no ulcerations; mucous follicles not developed.

Abdomen.—Peritoneum lining abdominal muscles pale, and perfectly dry; no serosity in abdominal cavity; intestines moderately distended with gas, and pale, except a portion of small intestine, afterwards found to be the ileum which presents a reddish appearance; surface moist; several stains of a deep yellow colour upon the large intestine where it lay in contact with the gall bladder. *Liver* very slightly if at all engorged, its anterior edge or border not extending more than three or four lines below the margin of the ribs; colour pale red, tissue quite firm, not engorged, the two substances quite distinct; gall bladder moderately distended with bile, staining the finger a deep orange; lining membrane of a uniform tea green colour. *Stomach*.—Pale externally, except at its greater extremity, where it has a slate-coloured appearance; mucous membrane pale, of normal consistence, except at the great cul-de-sac, where it is of a deep slate-colour, and much softened, slight pressure with the finger nail reducing it to a pulp. *Small intestine*.—Duodenum moderately distended, neither contracted nor dilated; peritoneal surface of a light rose colour, owing to the presence of numerous small arborescent vessels, perfectly distinct from each other; held up to the light it exhibits numerous black points, each of the size of a small grain of sand, distinctly visible; it contains a considerable quantity of matter of a light yellow colour, having a somewhat frothy or curdled appearance and a pap-like consistence; mucous membrane in a space of four inches from the pyloric orifice of stomach of a dull red or brick-dust colour, minutely injected with red vessels, and in several points more especially upon the surface of the valvulæ conniventes, presenting a dotted appearance. In a space one inch in extent from the pylorus the mucous membrane is uneven to the touch from the presence of numerous crypts in a state of development; mucous follicles throughout very numerous and distinct, the centre of each being marked by a black point, corresponding with that observed on the outer surface through the coats of the intestine; they are more abundant and more closely approximate each other in the upper third, where, in some places, they are scarcely half a line apart. In the lower third these points are much more sparse, but occasional agglomerations nevertheless occur; the mucous membrane, except in the space above described, is quite pale and of normal consistence, yielding strips four lines in length. The jejunum contains a quantity of yellowish matter, paler than that in the duodenum, and less abundant; mucous membrane pale, not softened, yielding strips five lines in length; cryptæ much less numerous than in duodenum and less distinct. Mucous membrane of *ileum* pale, with occasional arborizations, communicating to the intestine a light rose or pink coloured hue in the spots in which they occur; consistence normal, yielding strips of same length as in duodenum. About four or five feet from the commencement of the small intestine is a group of muciparous glands isolated and considerably elevated above the surrounding mucous membrane, looking at first like ulcerations upon its surface, but on a more careful examination they are evidently mucous follicles, having each in its centre a minute opaque orifice; glands of Peyer more developed than in the healthy state, but not ulcerated; the contents of the intestine resemble those of the jejunum. *Large intestine*.—Mucous membrane of large intestine in a space about

five inches from its commencement, of a dirty yellow colour stained by the contents of the bowel; immediately below this, the colour is dusky yellow mottled with pink; the remaining portion of the large intestine is of a pink colour interrupted once or twice, but for a short distance, by patches of yellow; the pink coloured portion is very minutely injected, having an uniform dotted appearance; the follicles throughout are very numerous and distinct, the larger being about a line in diameter; they are more or less ulcerated, the mucous membrane being entirely destroyed in most of them, leaving the subjacent cellular tissue fully exposed; the mucous membrane of the intestine itself is softened, yielding strips from one to two lines in length. The contents of the large intestine consist of a yellowish matter, having about the consistence of thin cream, differing from the matter found in the small intestine, in being more abundant, of a darker hue, and more fluid.

Mesenteric glands enlarged, some of them of the size of a small bean; colour pale gray, tissue firm, pale, not tuberculous; *bladder* contracted; *spleen* of a bluish slate colour, not enlarged; *kidneys* healthy.

Treatment.—Notwithstanding the hopeless condition of the patient, it is our duty to make use of such means as afford any, even the slightest prospect of relief. These consist in the application of leeches to the temples and to the mastoid processes, with blisters to the nape of the neck. They should be dressed with mercurial ointment. The treatment in fact is the same as in tubercular meningitis, and we think we have derived more benefit from the use of blisters in that affection, than from any other means. Cloths wrung out of cold water, or of vinegar and water should be at the same time kept constantly applied to the temples.

Diagnosis.—Cholera infantum may be confounded with tubercular meningitis, or dropsy of the brain. From this, it may be distinguished by the frequency of the discharges, whereas, in the former affection the bowels are usually torpid, and by a proper acquaintance with the natural history of the disease. In tubercular meningitis the premonitory symptoms are such as indicate an affection of the brain; it occurs for the most part in delicate serofulous children. Cholera infantum commences with looseness of the bowels. In tubercular meningitis, the cerebral symptoms predominate in the commencement. The child is restless and irritable, and complains of acute pain in the head, referring it chiefly to the forehead; the pain is intermittent, and is usually accompanied with a peculiar cry, which has been considered by Coindet and others as pathognomonic; the sleep is more or less disturbed, and there is frequent tossing about of the hands; the head is rolled from side to side, and there is more or less moaning and grinding of the teeth; delirium is almost a constant symptom, and the countenance assumes a peculiar characteristic appearance; this is so marked that even the nurses at the children's hospital of Paris, easily recognize the disease. It is only in the advanced stages, that cholera infantum can be confounded with tubercular meningitis when the patient relapses into a state of drowsiness or stupor; which is a prominent symptom of the advanced stage of hydrocephalus, and is often

accompanied or preceded by convulsions. Cholera infantum may be confounded with the *typhoid fever* of children. To this affection it bears a close resemblance; it may be distinguished from it, however, by the absence of gargouillement, of the numerous lenticular spots which in typhoid fever usually make their appearance from the sixth to the twelfth day, by the agitation and slight delirium at night; the prominence of the spleen, the character of the fever, which is more intense, and continues beyond the ninth day; and the existence of the sibilant rale, all of which are prominent although not constant symptoms in typhoid fever.*

The resemblance between the two diseases is such that it is often impossible to distinguish them apart. Cholera infantum may also be confounded with softening of the stomach. The similarity between the symptoms of gelatinous softening of the stomach, as described by Jæger, and those of cholera infantum, appears indeed to be striking; the coincidence has been observed by Rilliet and Barthez, who do not describe the latter disease as a distinct affection occurring in Paris. The following are the signs of gelatinous softening of the stomach, as laid down by them in their invaluable work. If a child be taken suddenly with obstinate vomitings which persist, with insatiable thirst, with pain in the abdomen, with abundant diarrhœa; if at the same time it emaciates with rapidity, whilst the gastric symptoms *almost exclusively* predominate, we may then infer a gelatinous softening of the stomach.—(Tom. i. p. 467. Art. *Gastrite et Ramollissement de l'Estomac*.)

Prognosis.—The prognosis in cholera infantum may be considered favourable when the pulse becomes slower, when the temperature is restored to the surface, when the vomiting ceases, and the alvine discharges become less frequent, and more natural; an opposite opinion may be formed when the pulse continues feeble; the surface remains cold; the discharges become very frequent, resembling the washings of meat, accompanied with great uneasiness and jactitation, or a disposition to stupor; should there be rigidity and a partial loss of power of the extremities, the patient may be considered almost if not entirely beyond the reach of art.

* Rilliet et Barthez, *Traité clinique et pratique des maladies des enfans*, t. ii., p. 312

NO.	SEX.	AGE.	DRAIN.	THORAX.	ABDOMEN.
1	Male.	3 months.	Not examined.	Right lung hepatized in- jection; pleuritic indurations of left side; left cavity fill- ed with pus; hepatization of left lung; bronchial tubes injected; heart of normal dimensions, but pushed considerably to right side.	Mucous membrane of large intestine pale, except two small arborizations; follicles greatly developed; mucous membrane of stomach softened, pale; liver somewhat enlarged; tissue congested; mucous membrane of small intestine natural; small and large intestines contain a quantity of yellowish fluid; bladder injected; other organs healthy.
2	Fe- male.	6 months.	Congestion of veins of pin water much enlarged; injected; no opacity of arachnoid; no subarach- noid effusion; substance of brain healthy; no effusion within ventricles.	Lobular pneumonia; a few lobules of emphysema along the anterior margin of upper lobe of right lung; no effusion; substance of lining membrane of trachea and bronchial tubes in- jected; heart natural.	Mucous membrane of stomach injected at great cul-de-sac; slightly softened along the greater curvature; stomach contains about a teaspoonful of laudorous fluid; mucous membrane of small intestine pale, and of normal consistence through- out; glands of Peyer healthy; the small intestine containing a quantity of mucus of no consistence of pulp, yellowish in the duodenum, of a light orange colour in the jejunum; crypts indistinct, except in a space about an inch in extent at commence- ment of intestine; mucous membrane of large intestine coated with a layer of mucus of a dirty white colour; mucous membrane highly inflamed throughout; glands greatly developed, many of them ulcerated; membrane softened. <i>Liver</i> not enlarged, texture firm; gall bladder contains about 5 ss of orange coloured bile; peritoneal coat of intestines dry as if wiped with a cloth. Bladder, spleen, and kidneys healthy.
3	Fe- male.	1 year 8 months.	But little effusion of blood on separation of dura mater; no subarachnoid effusion; veins of pin water much congested; pin water not injected; substance of brain softened; no effusion with- in the ventricles.	Lungs unorged; no in- jection of trachea, or bron- chial tubes; heart natural.	Mucous membrane of stomach pale and of normal consistence, except in great cul-de-sac, where it is of a deep slate colour, and softened; no peritoneal effusion; that portion of peritoneum lining abdominal muscles perfectly dry; liver very slight- ly, it is all enlarged; tissue firm; <i>gall bladder</i> distended with bile staining the finger a deep orange; small intestine contains a quantity of yellowish matter of pulp-like consistence, of a lighter colour in the jejunum; mucous membrane of the small intes- tine four inches in extent from pylorus, of a dull red or brick-dust colour, minutely injected; mucous follicles throughout duodenum numerous and distinct; less nume- rous and distinct in jejunum; mucous membrane of ileum pale, with occasional arbo- rizations; rest of small intestine pale, with the exception above mentioned; consist- ence normal; plaques of Peyer more developed than in the healthy state, but not ulcerated; mucous membrane of large intestine inflamed and softened; follicles much developed and more or less ulcerated.

NO.	SEX.	AGE.	BRAIN.	THORAX.	ABDOMEN.
4	Male.	2 years 2 months	But little blood exterior to the dura mater; veins of pia mater much distended; slight subarachnoid effusion; pia mater moderately injected; right hemisphere and central portions of brain suffer than natural; a spoonful of limpid serum in each ventricle.	Pleura free; lungs engorged posteriorly and inferiorly; heart normal.	Peritoneum dry as if wiped with a cloth; liver not enlarged, tissue firm, not engorged; gall bladder greatly distended with thin fluid bile, staining the finger a light orange; stomach contains a quantity of matter of a dirty-green colour, of the consistence of gruel; mucous membrane pale and more or less softened throughout; thinner than natural in the great cul-de-sac; mucous follicles distinct, but not remarkably developed; small intestine pale throughout, except in a space two inches or more in extent, at the superior extremity of the ileum; one of the glands of Peyer reddened, and slightly prominent, but not ulcerated; mucous follicles distinct in the ileum, less in rest of intestine; contents of a liquid yellow colour approaching to orange; feces yellow in large intestine; mucous follicles very abundant, margins much inflamed; mucous membrane swollen; other organs healthy.
5	Female.	15 months	Veins of pia mater moderately distended; considerable quantity of subarachnoid effusion; arachnoid moist; pia mater somewhat injected; medullary substance of moderate firmness; no serosity in cavity of ventricles.	Lower lobes engorged; heart normal.	No peritoneal effusion; a small ulcer at the lower extremity of the œsophagus; liver enlarged; tissue firm, of a pale fawn colour internally; gall bladder distended with bile of the colour of W. India molasses, staining the finger a dark orange; stomach contains a quantity of darkish coloured fluid, having the consistence of gruel; mucous membrane pale; crypts largely developed; duodenum pale red in a space two inches from pylorus; a slight arborization in the jejunum about an inch in extent; crypts few and indistinct; first eight inches of ileum healthy, remainder more or less inflamed and softened; plagues of Peyer developed, but not ulcerated; duodenum contains a quantity of orange coloured mucus, of the consistence of pap; jejunum contains a quantity of matter similar in consistence to that of the duodenum, but of a paler colour; large intestine contains a quantity of yellowish matter thinner and paler than in small intestine; mucous follicles greatly developed and ulcerated; mucous membrane inflamed and softened; mesenteric glands enlarged, some of them of the size of a small bean. Bladder and other organs healthy.
6	Male.	2 months	Veins of pia mater much distended; no opacity of subarachnoid; slight effusion beneath; pia mater moderately injected; cortical and medullary portions of brain healthy; no effusion within the ventricles.	Lobular pneumonia of both lungs; bronchial tubes injected.	Liver not enlarged or congested; colour brownish-yellow, tissue firm; gall bladder moderately distended with fluid of an orange-brown colour; stomach contains a moderate quantity of fluid looking like gum water; mucous membrane much injected throughout; small intestine covered with a thin layer of mucus; mucous membrane pale, but softened; glands of Peyer healthy; mucous crypts not distinct except at its upper extremity in the space of an inch, which is thickly studded with them; it contains a quantity of yellowish fluid; large intestine contains feces of a green colour, mixed with yellow lumps; surface covered with a layer of dirty white mucus; mucous membrane of a light pink colour throughout; mucous crypts developed but not evidently ulcerated, many of a bright red or pink colour.

7	Male.	13 mo's	Veins of pia mater moderately distended; no marked injection of the pia mater; arachnoid pale and moist; a considerable amount of light citron coloured effusion beneath it; cortical and medullary substance of brain healthy; ventricles contain each about 5ss of serosity; cerebellum healthy.	Lungs engorged posteriorly; lobular pneumonia of right lung; trachea and bronchial tubes somewhat injected; heart normal.	Liver greatly enlarged, occupying about two-thirds of the abdominal cavity; tissue moderately firm, presenting a light yellow colour throughout; two substances very indistinct; gall bladder distended with bile of the consistence of W. India molasses; spleen congested; stomach contains a considerable quantity of dark coloured fluid; mucous membrano pale and of good consistence; small intestine contains a considerable quantity of fluid of the colour and consistence of gravel; towards the lower extremity of the ileum it has a yellowish hue; mucous membrane pale throughout, but softer than natural; crypts very distinct, especially in the lower part of the ileum; glands of Peyer healthy; large intestine contains a moderate quantity of yellowish feces; mucous membrano quite pale, except in a space four or five inches from its inferior termination, which presents a slight trace of redness; mucous crypts greatly developed; no ulcerations; mucous membrano softer than natural; mesenteric glands and other organs healthy.
8	Male.	3 weeks	A considerable quantity of effusion in subarachnoid tissue; pia mater injected; substance of brain firm; little or no serosity in ventricles; consistence of cerebellum natural.	Lower lobe of right lung congested; lining membrane of trachea and bronchial tubes pale; pleura and bronchial glands healthy; heart healthy.	Stomach contains a quantity of gelatinous fluid looking like the white of an egg; mucous membrano thickly coated with same substance; liver much congested and friable; two substances indistinct; gall bladder distended with bile of the colour and consistence of W. India molasses; spleen healthy; a dozen of small gravelly concretions in right kidney; small intestine contains a quantity of mucus of a light yellow colour approaching to orange; mucous membrano of duodenum pale, except at its upper portion, in a space of about four inches, which presents a sludgy pink; three inches of lower portion of jejunum minutely injected and softened; consistence natural elsewhere; mucous membrane of ileum pale for the most part, presenting a slight tinge of pink in spots, softened in injected portions, but elsewhere normal; numerous follicles are observed in the lower part of the ileum; plaques of Peyer healthy; large intestine intensely inflamed throughout its whole extent; mucous membrane thickened; follicles less developed than usual, several of them ulcerated; internal surface coated with a thick layer of mucus; mesenteric glands healthy.
9	Male.	9 months	Veins of pia mater distended; serous milky serum in subarachnoid tissue; pia mater injected; ventricles contain about 5ss of citron coloured serum; medullary substance injected, of natural consistence; cor-	Lungs slightly engorged; bronchial membrane pale; heart normal.	Liver somewhat enlarged, of a light chocolate colour internally; tissue firm, not engorged; gall bladder much distended with dark coloured bile; mucous membrano of esophagus of a deep red colour at its lower part; mucous membrano of stomach thickly covered with a coating of whitish opaque mucus; somewhat softened along the greater curvature; numerous arborizations in great cul-de-sac; mucous follicles distinct; mucous membrano of small intestine pale throughout, and of normal consistence; mucous follicles but low in number; glands of Peyer healthy; large intestine covered with a thick layer of tenacious mucus; membrane more or

NO.	SEX.	AGE.	BRAIN.	THORAX.	ABDOMEN.
			Ictal substance healthy; slight opacity of arachnoid at base of brain.		less inflamed throughout; mucous crypts highly developed, and more or less ulcerated, none of the ulcerations in the rectum extending as far as the muscular coat; mucous membrane softened throughout; mesenteric glands and other organs healthy.
10	Fe-male.	6 months	Arachnoid pale and transparent, moist; pia mater slightly injected; a considerable quantity of serum in subarachnoid tissue; veins of pia mater moderately distended; cortical substance healthy; medullary substance pale; medullary portions of corpus callosum softened; 5/6 of serum in lateral ventricles.	Lungs slightly engorged; a few lobules of hepaticization; heart normal.	Liver of a deep purple colour, engorged; gall bladder moderately distended with dark coloured bile, staining the finger light yellow; mucous membrane of stomach pale, and apparently of good consistence; crypts not apparent; duodenum and upper portions of jejunum contain a quantity of orange coloured mucus; mucous membrane of small intestine pale throughout, with the exception of a slight orozation at the lower extremity of the ileum; large intestine contains a moderate quantity of feces of a greenish colour; mucous membrane injected, but to a much greater extent in its lower half; the redness appearing in the form of patches and bands; mucous follicles greatly developed and ulcerated; mucous membrane more or less softened.
11	Fe-male.	7 months	Head not examined.	Lungs slightly engorged inferiorly; mucous membrane of trachea and bronchial tubes slightly injected; heart normal.	Liver not in the least engorged; tissue pale; the gall bladder contains a considerable quantity of bile staining the finger Indian-yellow; mucous membrane of stomach pale, except along greater curvature, where it is slightly injected; membranous softened throughout; in the great cul-de-sac the softening extends to all the coats (amollissement gélatineux of Cruveilhier); mucous membrane of small intestine pale and of good consistence; the glands of Peyer present their usual appearance, with the exception of two large plaques at the inferior extremity, which are somewhat injected; mucous follicles highly developed at the inferior extremity of the intestine, in a space of about four inches, elsewhere they are scarcely perceptible; the duodenum contains a moderate quantity of orange coloured matter of the consistence of pap; contents of ileum light yellow; jejunum empty, coated with a layer of mucus of moderate thickness; mucous membrane of large intestine softened and coated throughout with a thick layer of mucus; lower half much injected, the inflammation existing in the form of bands of a brick-dust colour; mucous follicles very distinct but not ulcerated; mesenteric glands and other organs healthy.

12 Mo.	12 weeks		
	<p>Veins of pia mater much distended; arachnoid normal; moderate effusion beneath; moderate injection of pia mater confined to the larger vessels; injection of right hemisphere, consistency normal; minute injection of middle and posterior lobes of left hemisphere; consistency of left hemisphere softer than that of right; a tabesponsif of limpid serum in lateral ventricles; slight injection of cortical substance; thalami nerv. optico; and corpora striata normal.</p>	<p>Pleurae pale, no effusion; lungs crepitant; slight engorgement of lower lobes; no tubercles; mucous membrane of trachea and bronchi pale; heart and pericardium healthy.</p>	<p>Peritoneum pale, no effusion; liver of a reddish-brown colour inferiorly; tissue slightly engorged, not apparently enlarged; gall bladder moderately distended with dark coloured bile of the consistence of syrup, staining the finger a deep orange; spleen of a deep brown colour externally, mottled with patches of a darker hue; kidneys pale red, not engorged; mucous membrane of stomach pale and of good consistence; crypts scarcely visible; small intestine contains a quantity of yellowish matter, of an orange colour in the duodenum and jejunum; mucous membrane softened inferiorly; follicles scarcely visible; plaques of Peyer normal; large intestine contains a quantity of mucus of a grayish colour; mucous glands greatly developed, many of them surrounded by a ring of inflammation, with numerous vessels radiating from them, and intermingling with each other; none of the follicles ulcerated; mucous membrane for the most part pale, with a tinge of pink; consistence of mucous membrane normal; mesenteric glands firm, the largest about six lines in length; bladder healthy.</p>